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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,883	10/25/2003	Jason M. Chilcote	H0004596	1908

7590 11/04/2005

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EXAMINER	
WHITTINGTON, KENNETH	

ART UNIT	PAPER NUMBER
2862	

DATE MAILED: 11/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,883	CHILCOTE ET AL.	
	Examiner	Art Unit	
	Kenneth J. Whittington	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-16 and 18-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-16 and 18-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Bot Ledynh
Primary Examiner

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/19/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The Request for Continued Examination filed September 23, 2005 has been approved and the Amendment filed therewith entered.

Claim Objections

Claims 1, 10 and 13 are objected to for not containing a definition of "anisotropic shape". As is well known in the art, shape anisotropy is a property of any ferromagnetic material, the shape affecting the magnetization of the material differently in different directions (See van Dover et al. article, Magnetic Materials, pages 3-4). However, neither the claims nor the specification provide what is the "anisotropic shape" of the ferromagnetic runner as recited in the claim. Appropriate correction is thus required. Since any ferromagnetic material has shape anisotropy, the claims will be interpreted to mean that any ferromagnetic material, such as the recited runner, has an anisotropic shape.

Claim 4 is objected to because of the following informalities:

"said interfacing circuit" in lacks antecedent basis. The interfacing circuit is introduced in claim 3. Amending this

claim to depend from claim 3 would overcome the objection. Appropriate correction is required.

Claim 20 is objected to because it contains features inconsistent with the specification. This claim recites interfacing the runner and coil utilizing an interfacing circuit. As recited in the specification in paragraph 0023, the interfacing circuit is implemented by integrating the runner and coil. Thus, the claim essentially recites utilizing an integrated runner and coil to interface the runner and coil, an apparently circular operation, which is not taught or discussed in the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4, 6-16 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Bosch (DE3420709). Regarding these claims, Bosch discloses a magnetic sensor comprising a permalloy runner having an anisotropic shape and locatable relative to a target (See Bosch FIGS. 1-3, item 15), and a single coil structure tightly wound about the

ferromagnetic runner (See FIGS. 1-3, item 14), the coil comprising a plurality of interconnecting metals for integrating the runner the coil with an interfacing circuit (See FIGS. 2 and 3), further comprising a conductive semi-conductive layer beneath the runner and an insulated metal to integrate the runner and coil (See FIGS. 2 and 3).

It is noted that the remaining portions of claims 1, 2, 8, 10, 11, 12, 13, 14, 19 and 20 are directed to properties of the above noted structure, i.e., a coil wound about a permalloy core. For example, the feature that "when a magnetic field changes direction along an axial length of the runner, voltage is induced in the coil proportional to a time change of the magnetic flux thereof." This is simply based upon Faraday's Law which states that

Emf = V = -[{change in flux}/{change in time}],

when the area to which the magnetic field is applied is constant:

V = -Area * [{magnetic field change}/{change in time}]

and for an inductor with N number of turns, this equation becomes

V = -N * Area * [{magnetic field change}/{change in time}].

Regarding the recited features of "producing a sudden change in a magnetization vector thereof to create a large time

rate of change of magnetic flux density and enable sensing operations by said magnetic sensor"; "producing a voltage spike amplitude for an interfacing circuit induced therein when said magnetic field changes direction along said axial length of said ferromagnetic runner"; and wherein "said magnetic sensor is highly sensitive and operates upon a negligible electrical current", it is noted that these features are merely properties of a sensor comprising a coil surrounding a permalloy core as described by Applicant in the specification.

Because Bosch discloses the structures described and claimed by applicant in the specification and claims, the apparatus of Bosch has the properties of the structures as noted by Applicant, and therefor Bosch anticipates the claimed invention.

Claims 1, 2, 6, 7, 9, 13, 14 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Ramsden (Sensor Applications for Magnetic Materials). Regarding claims 1, 6, 7, 9, 13, 18 and 19, Ramsden discloses a magnetic sensor comprising a permalloy runner having an anisotropic shape and locatable relative to a target (See Ramsden pages 3 and 4, FIG. 8, note permalloy core and the magnetic field applied to sensor would be provided by a magnetic field generator readable as a target),

and a coil structure tightly wound about the ferromagnetic runner (See same figure of Ramsden).

It is noted that the remaining portions of claims 1, 2, 6, 7, 9, 13, 14, 18, 19 and 20 are directed to properties of the above noted structure, i.e., a coil wound about a permalloy core. For example, the feature that "when a magnetic field changes direction along an axial length of the runner, voltage is induced in the coil proportional to a time change of the magnetic flux thereof." This is simply based upon Faraday's Law which states that

Emf = V = -[{change in flux}/{change in time}],

when the area to which the magnetic field is applied is constant:

V = -Area * [{magnetic field change}/{change in time}]

and for an inductor with N number of turns, this equation becomes

V = -N * Area * [{magnetic field change}/{change in time}].

Regarding the recited features of "producing a sudden change in a magnetization vector thereof to create a large time rate of change of magnetic flux density and enable sensing operations by said magnetic sensor"; "producing a voltage spike amplitude for an interfacing circuit induced therein when said magnetic field changes direction along said axial length of said

ferromagnetic runner"; and wherein "said magnetic sensor is highly sensitive and operates upon a negligible electrical current", it is noted that these features are merely properties of a sensor comprising a coil surrounding a permalloy core as described by Applicant in the specification.

Because Ramsden discloses the structures described and claimed by applicant in the specification and claims, the apparatus of Ramsden has the properties of the structures as noted by Applicant, and therefor Bosch anticipates the features recited in the claims.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 3, 4, 8, 10-12, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramsden in view of Dezuari et al. (Development of a Novel Printed Circuit Board Technology of Inductive Device Applications). Regarding claims 3, 4, 8, 10, 11, 15 and 16, Ramsden teaches all the features of claims 1 and 13 as discussed above. However, Ramsden does not explicitly disclose a manufacturing method of the coil design. Dezuari et al. teaches methods for interconnecting metals or

semiconductor layers located beneath the runner and insulating metal both of which are used to create an interface circuit which integrates the runner and the coil (See Dezuari et al. page 2, 2.2 Fabrication process and note figures). It would have been obvious to a person having ordinary skill in the art to apply the fabrication process disclosed in Dezuari et al. to the sensor disclosed in Ramsden. One having ordinary skill in the art would have been motivated to do so to increase the miniaturization of such inductive devices (See Dezuari et al. page 1, note Introduction).

Regarding claim 12, because Ramsden disclose the structures of claim 10 as noted above, it has the same properties in view of the recitation of Farraday's Law noted above.

Response to Arguments

Applicant's arguments filed September 23, 2005 have been fully considered but they are not persuasive. In the Remarks portion of the Amendment, Applicant has outlined the various properties of permalloy and a sensor comprising a permalloy runner with a coil wrapped there around. However, these properties does not distinguish the prior art device of Bosch or Ramsden from the claimed invention because these references have the same structure and material make-up as both the claimed

invention and the invention described in the specification, and accordingly, will have the same properties.

Applicant has also asserted that the prior art references utilize slow changes in H whereas the invention is utilizing material that can produce a sudden flip in M. It is noted again that Bosch and Ramsden are using the same permalloy runner with a coil wrapped therearound as recited in the claim and disclosed in the specification. Accordingly, these prior art devices would operate and have the same properties as both the claimed invention and the sensor discussed in the specification.

Because Applicant has not illustrated any structural features or otherwise that distinguish the apparatus of the prior art with that of the claimed invention, the rejection stands.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be

reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kenneth J Whittington
Examiner
Art Unit 2862

kjw